ENVIRONMENTAL PRODUCT DECLARATION

INSULATED CONCRETE BLOKS

ACCORDANCE WITH EN 15804 +A2 & ISO 14025

Rakennustieto EPD
EPD Number: RTS_373_25
Publication date: 19.3.2025
Valid until: 19.3.2030

www.hb.fi

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	HB-Betoniteollisuus Oy
Address	Betonitehtaantie 1, Jyväskylä
Contact details	
Website	https://hb.fi/

PRODUCT IDENTIFICATION

Product name	Non-reinforced concrete products : Insulated concrete blocks
Additional label(s)	-
Product number / reference	EMG400 suora EMG400 pääty EMG400 kulma o/v
Place(s) of production	Somero, Finland

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. EN15804 impact assessment indicators are based on EF 3.0.

EPD INFORMATION

EPD program operator	Rakennustieto EPD, Malminkatu 16 A, 00100 Helsinki, Finland https://ymparisto.rakennustieto.fi/
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. RTS PCR 2020
EPD author	Jere Peltomäki, Ida Karppinen, Anni Viitala, Granlund Oy, Malminkaari 21, 00701 Helsinki, Finland
EPD type	Product EPD
EPD verification	Independent verification of this EPD and data, according to ISO 14025: External verification
Verification date	5.2.2025
EPD verifier	Mari Kirss, Rangi Maja OÜ
EPD number	RTS_373_25
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EPD valid until	19.3.2030

Jukka Seppänen
RTS EPD Committee Secretary

Laura Apilo
Managing Director

VERIFICATION STATEMENT

The declaration complies with the requirements set by the European standard EN 15804:2012 + A2:2019 (rules regarding the product category)	
In accordance with the international standard EN ISO 14025:2010, the independent verifier is as follows	
☐Internal	☒External
Name, signature and organization of third-party verifier Mari Kriss Rangi Maja OÜ  Tallinn, Estonia 05.02.2025	

PRODUCT INFORMATION

PRODUCT DESCRIPTION

Non-reinforced concrete products consist of aggregate and precast concrete blocks, and which are intended to various use in construction sites. Aggregate and precast blocks are well-suited for use in foundations, floor structures, exterior walls, pillars, and partition walls. The blocks provide resistance to moisture and weather, along with sound insulation, airtightness, and thermal insulation.

PRODUCT APPLICATION

Products are intended to various use in construction sites.

PRODUCT STANDARDS

No product standards considered.

PRODUCT RAW MATERIAL COMPOSITION

Product	Weight per 1 m³	Construction aggregate	Cement	Additives	Polystyrene
Insulated concrete blocks	2249	80 %	17 %	3 %	0,02 %
Raw material origin		FI	FI	FI	FI

PACKAGING MATERIAL COMPOSITION

Main packaging materials of products per declared unit are presented in table below.

Packaging material	weight %
EUR Pallet	96,65 %
LDPE packaging film	3,35 %
Total mass of materials	**0,0022 kg**

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	1 year, 2023

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 kg of product
Mass per declared unit	1 kg

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0 kg
Biogenic carbon content in packaging, kg C	0,0456 kg

SYSTEM BOUNDARY

The studied system boundary is Cradle to gate with options; module A5, modules C1–C4, module D (A1–A3, A5, C1-C4 and D). The studied system covers the following steps of life cycle according to EN 15804: A1 Raw material supply, A2 Transport, A3 Manufacturing, A5 Installation to building, C1 Deconstruction, C2 Transportation of end-of-life C3 Waste processing, C4 Disposal and stage D the benefits and loads beyond the system boundary, which consist of product reuse, recovery and recycling. The life-cycle modules are listed in the following table.

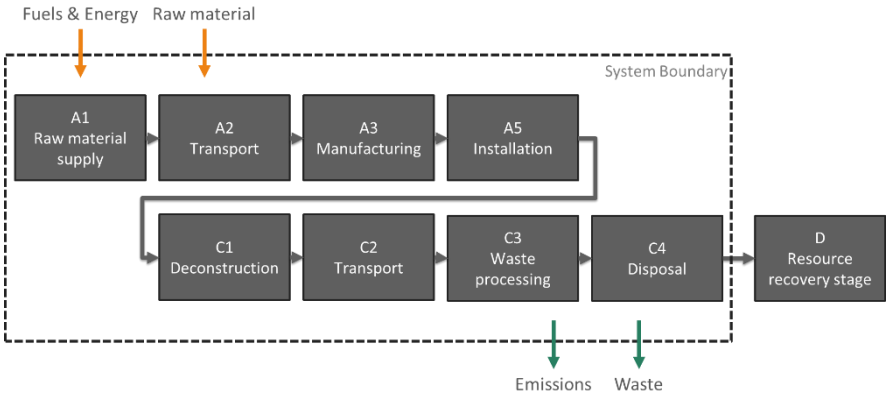
	Product Stage			Construction Process Stage		Use Stage							End-of-Life Stage				Benefits and loads beyond the system boundary		
	Raw material supply	Transport	Manufacturing	Transport to building	Installation to building	Use/applications	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling
Stage	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
Included	X	X	X		X								X	X	X	X	X	X	X
Relevancy	R	R	R	NR	R	NR	NR	NR	NR	NR	NR	NR	R	R	R	R	R	R	R

Mandatory
Mandatory as per the RTS PCR section 6.2.1 rules and terms
Optional modules based on scenarios

The study does not omit any life cycle stages, processes or data needs that are mandatory according to EN 15804 and RTS PCR. The study excludes following life cycle stages which are optional according to EN 15804 and RTS PCR:

- A4 transport to market
- B1 Use
- B2 Maintenance
- B3 Repairs
- B4 Replacement
- B5 Refurbishment
- B6 Operational energy use
- B7 Operational water use

System boundary describing the system boundary and the input and output flows is presented below.

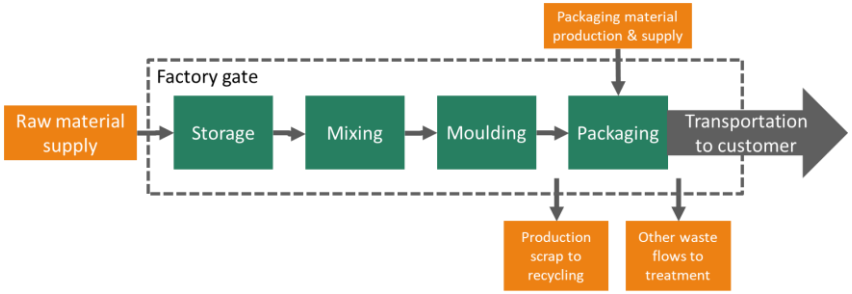


LCA System Boundary of studied products

The end of waste point of the production scraps is the point where it is processed to be ready to use in following life cycles. For example for incinerated waste streams, it is the incineration of the materials, which results as energy that is then available for consumption in the following life cycle. For paper waste, it is ready to be used as secondary raw material after sorting. End of waste point of the studied product is the step when material is used is crushed and/or landfilled and available to be used to replace primary crushed gravel. EoW point of the packaging materials collected for recycling in A5 module is the point when materials are collected and handled in the sorting plant. Due to the insignificant amounts of packaging materials compared to the product mass, EoW treatments of packaging materials were not modelled separately.

THE PRODUCTION PROCESS OF STUDIED PRODUCT

Production stage (A3) of HB-Betoniteollisuus' production sites cover following manufacturing processes; raw material supply, processing, packaging the final product. After that, products will be transported to the customer. The production processes of the studied product are presented in following Figure.



CUT-OFF CRITERIA

This study follows the cut-off criteria stated in RTS PCR and EN 15804 -standard. This study does not exclude any modules or processes which represent more than 1 % of the emissions of studied life cycle stage. The study does not exclude any hazardous materials or substances. Machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

Process excluded from study	Cut-off criteria	Quantified contribution from process
A4 Transport to building	Not relevant for the product group according to RTS PCR rules	
B1-B7 Use stage	Not relevant nor mandatory for the product group	-

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation rules used are made according to the ISO14044:2006. Allocation is avoided when possible and when necessary, allocation is made based on physical shares and also avoiding double calculations. Allocation is required if the production process produces more than one product and the flows of materials, energy and waste cannot be separately measured for the studied product. Allocation used in generic data sources follow the requirements of the EN 15804 -standard. It should be noticed that the allocation method 'allocation, cut-off by classification' has been used for Ecoinvent 3.8 data, which complies with EN 15804. Avoiding allocation could not be avoided for following inputs as the information was only measured on factory process level.

- Electricity consumption, fuels for process: only measured on factory level.
- Production waste flows: only measured on factory level.
- Production water consumption: only measured on factory level
- Packaging materials: only measured on factory level.
- Ancillary materials: only measured on factory level.

According to EN 15804, flows leaving the system at the end-of-waste boundary of the product stage (A1-A3) are allocated as co-products. According to EN 15804, process that has a very low contribution to the overall revenue may be neglected in co-product allocation.

No allocations were made, since the production scrap of the products are given free of charge out of the factory after crushing. Since there is no financial impact from the aggregate, no allocation is made. Crushing of the production scrap was included in the fuels consumed in the production sites as it could not been separated from the total fuel consumption.

KEY ASSUMPTIONS

The scenarios included are currently in use and are representative for one of the most likely scenario alternatives.

C1-C4 End of life scenario: End of life scenario was assumed based on the common practices of construction products in Finland and product's market area in Europe (SYKE 2021.)

- C1: Deconstruction/demolition: It was assumed that the products are disassembled and processed. The energy use (diesel usage) in the demolition stage is 1,30 kWh/t (Erlandsson, M. & Pettersson, D., 2015.)
- C2: Transportation distance 75 km road driving by lorry. (SYKE 2021.)
- C3-C4: It was assumed that 80% is sent for recycling and 20% to final disposal. It was also assumed that EPS insulation is not separated from the product before crushing, due to its small proportion so it remains in the crushed material.
- Module D covers the net benefits and loads arising from the reuse of products or the recycling or recovery of energy from end-of-waste state materials.
    - Loads: It is assumed that the concrete material going for recycling reaches its EoW point after recycling process, so it does not require further processing before being available to replace primary materials. Therefore, there are no loads generated in the D-module
    - Benefits: Material stream going into the reuse replaces primary production of gravel.

AVERAGES AND VARIABILITY

The quality requirements for the life cycle assessment were set according to the EN ISO 14044 standard (4.2.3.6) and EN 15804 standard (6.3.7).

This LCA study follows the standard EN 15804:2012+A2:2019 and PCR and no decisions are made based on the values.

PROCEDURED FOR COLLECTION PROCESS SPECIFIC DATA

Production specific data was collected directly from manufacturer's production plant. The data represents the production of the studied product at the plant from the materials transported to the facility and represents 1 year average. The data represents year 2023, which was the latest year with full year data. All gathered data was used without excluding categories in advance following the system boundaries set in earlier chapters.

CRITERIA FOR CHOOSING THE GENERIC DATA

Generic data that was used for upstream and downstream processes represents complementary data from Ecoinvent 3.8 database.

The datasets were chosen to represent the studied system as closely as possible. When available supplier specific information was used for instance in form of EN 15804 EPDs or emissions profile of local energy supplier. When supplier specific information was not available the information sources were chosen based on their technical and geographical representativeness. Only when country specific or European data has not been available has global level data been used (concerns mainly data from ecoinvent 3.8)

As up-to-date data as possible was chosen and no more than five-year-old for producer specific data and ten years for generic data was used.

ENVIRONMENTAL IMPACT DATA

INSULATED CONCRETE BLOCKS

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	9,08E-02	4,83E-02	4,30E-04	7,03E-03	3,22E-03	1,06E-03	-1,24E-02
GWP – fossil	kg CO_2e	1,37E-01	2,51E-03	4,30E-04	7,03E-03	3,22E-03	1,05E-03	-1,24E-02
GWP – biogenic	kg CO_2e	-4,58E-02	4,58E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	9,07E-05	1,52E-07	4,28E-08	2,60E-06	3,20E-07	9,96E-07	-1,26E-05
Ozone depletion pot.	kg CFC_{-11}e	9,21E-09	6,58E-11	9,21E-11	1,62E-09	6,85E-10	4,26E-10	-1,71E-09
Acidification potential	mol H^+e	4,94E-04	1,58E-06	4,49E-06	2,98E-05	3,34E-05	9,92E-06	-8,58E-05
EP-freshwater[3)]	kg Pe	4,54E-06	4,38E-09	1,42E-09	5,78E-08	1,06E-08	1,10E-08	-4,54E-07
EP-marine	kg Ne	8,63E-05	5,38E-07	1,98E-06	8,85E-06	1,48E-05	3,43E-06	-2,25E-05
EP-terrestrial	mol Ne	1,97E-03	5,87E-06	2,17E-05	9,78E-05	1,62E-04	3,77E-05	-2,67E-04
POCP (“smog”)	kg NMVOCe	4,80E-04	1,69E-06	5,96E-06	3,13E-05	4,45E-05	1,10E-05	-7,29E-05
ADP-minerals & metals	kg Sbe	1,82E-07	1,17E-09	2,18E-10	1,65E-08	1,63E-09	2,42E-09	-9,52E-08
ADP-fossil resources	MJ	7,74E-01	3,93E-03	5,78E-03	1,06E-01	4,32E-02	2,89E-02	-1,79E-01
Water use[2)]	m^3e depr.	3,10E-02	6,76E-05	1,56E-05	4,71E-04	1,16E-04	9,16E-05	-1,29E-02

1)GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A5	C1	C2	C3	C4	D
Renew. PER as energy	MJ	8,49E-01	1,21E-04	3,31E-05	1,19E-03	2,47E-04	2,51E-04	-1,06E-02
Renew. PER as material	MJ	4,00E-01	-4,00E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,25E+00	-4,00E-01	3,31E-05	1,19E-03	2,47E-04	2,51E-04	-1,06E-02
Non-re. PER as energy	MJ	7,29E-01	3,93E-03	5,78E-03	1,06E-01	4,32E-02	2,89E-02	-1,79E-01
Non-re. PER as material	MJ	6,76E-02	-6,76E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-ren. PER	MJ	7,96E-01	-6,36E-02	5,78E-03	1,06E-01	4,32E-02	2,89E-02	-1,79E-01
Secondary materials	kg	3,44E-02	1,48E-06	2,26E-06	2,94E-05	1,69E-05	6,05E-06	8,00E-01
Renew. secondary fuels	MJ	8,05E-02	1,73E-08	7,38E-09	2,96E-07	5,51E-08	1,58E-07	-1,07E-06
Non-ren. secondary fuels	MJ	7,96E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	7,92E-04	1,75E-06	3,51E-07	1,37E-05	2,62E-06	3,16E-05	-3,12E-04

1)PER = primary energy resources; Non-ren = Non renewable

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1,40E-03	5,38E-06	7,74E-06	1,40E-04	5,78E-05	0,00E+00	-7,29E-04
Non-hazardous waste	kg	3,45E-02	1,10E-03	5,43E-05	2,30E-03	4,06E-04	2,00E-01	-1,98E-02
Radioactive waste	kg	4,28E-06	2,35E-08	4,07E-08	7,07E-07	3,04E-07	0,00E+00	-1,03E-06

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A5	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	2,66E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	3,07E-02	1,40E-03	0,00E+00	0,00E+00	8,00E-01	0,00E+00	0,00E+00
Materials for energy recycling	kg	1,40E-03	9,74E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	8,09E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

BIOGENIC CARBON CONTENT

Biogenic carbon content	Unit (per declared unit)
Biogenic carbon content in product	0 kg
Biogenic carbon content in accompanying packaging	0,0456 kg

NOTE 1 kg biogenic carbon is equivalent to 44/12 kg of CO2

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity and district heat data source and quality	Electricity production; Heat and power co-generation, wood chips, 6667 kW, state-of-the-art 2014 (Reference product: electricity, high voltage) District heat production; Heat production, softwood chips from forest, at furnace 300kW (Reference product: heat, district or industrial, other than natural gas) EN15804+A2, Finland, 2021. Ecoinvent 3.8.
Electricity CO_2e / kWh	0.0515 kg CO2e / kWh

End of life scenario documentation for products per 1 kg of material

		Concrete product
Process flow		Mass
Collection process specified by type	kg collected separately	1,0 kg
	kg collected with mixed construction waste	
Recovery system specified by type	kg for reuse	0 kg
	kg for recycling	0,8 kg
	kg for energy recovery	0 kg
Disposal specified by type	kg material for final deposition	0,2kg
Assumptions for scenario development	units as appropriate	Waste materials are transported 75 km by truck to recycling facility with a truck capacity utilization of 45%

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ANNEX 1: EPD RESULTS BY RTS PCR REQUIREMENTS

RESULTS AS PER RTS PCR REQUIREMENTS

Impact category	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP – total	kg CO_2e	9,08E-02	4,83E-02	4,30E-04	7,03E-03	3,22E-03	1,06E-03	-1,24E-02
ADP-minerals & metals	kg Sbe	1,82E-07	1,17E-09	2,18E-10	1,65E-08	1,63E-09	2,42E-09	-9,52E-08
ADP-fossil	MJ	7,74E-01	3,93E-03	5,78E-03	1,06E-01	4,32E-02	2,89E-02	-1,79E-01
Water use	m^3e depr.	3,10E-02	6,76E-05	1,56E-05	4,71E-04	1,16E-04	9,16E-05	-1,29E-02
Secondary materials	kg	3,44E-02	1,48E-06	2,26E-06	2,94E-05	1,69E-05	6,05E-06	8,00E-01
Biogenic carbon content in product	kg C	0	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic carbon content in packaging	kg C	0,05	N/A	N/A	N/A	N/A	N/A	N/A